

1/9/1 (Item 1 from file: 34)  
DIALOG(R) File 34:SciSearch(R) Cited Ref Sci  
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12272194 Genuine Article#: 750RN Number of References: 24

Title: Cardiac catheterisation guided by MRI in children and adults with congenital heart disease

Author(s): Razavi R (REPRINT) ; Hill DLG; Keevil SF; Miquel ME; Muthurangu V; Hegde S; Rhode K; Barnett M; van Vaals J; Hawkes DJ; Baker E

Corporate Source: Univ London Kings Coll, Div Imaging Sci, Guys Hosp Campus/London SE1 9RT//England/ (REPRINT); Univ London Kings Coll, Div Imaging, Cardiac Magnet Resonance Res Grp, London WC2R 2LS//England/; Philips Med Syst, Best//Netherlands/; Guys Hosp, Dept Congenital Heart Dis, London SE1 9RT//England/; Guys Hosp, Dept Anaesthet, London SE1 9RT//England/

Journal: LANCET, 2003, V362, N9399 (DEC 6), P1877-1882

ISSN: 0140-6736 Publication date: 20031206

Publisher: LANCET LTD, 84 THEOBALDS RD, LONDON WC1X 8RR, ENGLAND

Language: English Document Type: ARTICLE

Geographic Location: England; Netherlands

Journal Subject Category: MEDICINE, GENERAL & INTERNAL

Abstract: Background Fluoroscopically guided cardiac catheterisation is an essential tool for diagnosis and treatment of congenital heart disease. Drawbacks include poor soft tissue visualisation and exposure to radiation. We describe the first 16 cases of a novel method of cardiac catheterisation guided by MRI with radiographic support.

Methods In our cardiac catheterisation laboratory, we combine magnetic resonance and radiographic imaging facilities. We used MRI to measure flow and morphology, and real-time MRI sequences to visualise balloon angiographic catheters. 12 patients underwent diagnostic cardiac catheterisation, two had interventional cardiac catheterisations, and for two patients, MRI was used to plan radiofrequency ablation for treatment of tachyarrhythmias.

Findings In 14 patients, some or all of the cardiac catheterisation was guided by MRI. In two patients undergoing radiofrequency ablation, catheters were manipulated with use of fluoroscopic guidance and outcome was assessed with MRI. All patients received lower amounts of radiation than controls. There was some discrepancy between pulmonary vascular resistance calculated by flow derived from MRI and the traditional Fick method. We were able to superimpose fluoroscopic images of electrophysiology electrode catheters on the three dimensional MRI of the cardiac anatomy.

Interpretation We have shown that cardiac catheterisation guided by MRI is safe and practical in a clinical setting, allows better soft tissue visualisation, provides more pertinent physiological information, and results in lower radiation exposure than do fluoroscopically guided procedures. MRI guidance could become the method of choice for diagnostic cardiac catheterisation in patients with congenital heart disease, and an important tool in interventional cardiac catheterisation and radiofrequency ablation.

Identifiers--KeyWord Plus(R): ANIMAL-MODEL; PLACEMENT; ANATOMY; CLOSURE;

1/9/2 (Item 2 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
(c) 2004 Inst for Sci Info. All rts. reserv.

11918255 Genuine Article#: 708FW Number of References: 123  
Title: Endovascular interventional magnetic resonance imaging  
Author(s): Bartels LW (REPRINT) ; Bakker CJG  
Corporate Source: Univ Utrecht, Med Ctr, Image Sci Inst, Dept  
Radiol, Heidelberglaan 100, Room E-01-335/NL-3584 CX  
Utrecht//Netherlands/ (REPRINT); Univ Utrecht, Med Ctr, Image Sci Inst,  
Dept Radiol, NL-3584 CX Utrecht//Netherlands/  
Journal: PHYSICS IN MEDICINE AND BIOLOGY, 2003, V48, N14 (JUL 21), PR37-R64  
ISSN: 0031-9155 Publication date: 20030721  
Publisher: IOP PUBLISHING LTD, DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE,  
ENGLAND

Language: English Document Type: REVIEW

Geographic Location: Netherlands

Journal Subject Category: ENGINEERING, BIOMEDICAL; RADIOLOGY, NUCLEAR  
MEDICINE & MEDICAL IMAGING

Abstract: Minimally invasive interventional radiological procedures, such as balloon angioplasty, stent placement or coiling of aneurysms, play an increasingly important role in the treatment of patients suffering from vascular disease. The non-destructive nature of magnetic resonance imaging (MRI), its ability to combine the acquisition of high quality anatomical images and functional information, such as blood flow velocities, perfusion and diffusion, together with its inherent three dimensionality and tomographic imaging capacities, have been advocated as advantages of using the MRI technique for guidance of endovascular radiological interventions. Within this light, endovascular interventional MRI has emerged as an interesting and promising new branch of interventional radiology. In this review article, the authors will give an overview of the most important issues related to this field. In this context, we will focus on the prerequisites for endovascular interventional MRI to come to maturity. In particular, the various approaches for device tracking that were proposed will be discussed and categorized. Furthermore, dedicated MRI systems, safety and compatibility issues and promising applications that could become clinical practice in the future will be discussed.

Identifiers--KeyWord Plus(R): GUIDED BALLOON ANGIOPLASTY; PASSIVE CATHETER

1/9/3 (Item 3 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
(c) 2004 Inst for Sci Info. All rts. reserv.

10072054 Genuine Article#: 477QG Number of References: 89  
Title: Interventional MRA and intravascular imaging  
Author(s): Ladd ME (REPRINT) ; Quick HH; Debatin JF  
Corporate Source: Univ Hosp Essen, Dept Radiol, OZ II, Hufelandstr 55/D-45122  
Essen//Germany/ (REPRINT); Univ Hosp Essen, Dept Radiol, D-45122  
Essen//Germany/  
Journal: JOURNAL OF MAGNETIC RESONANCE IMAGING, 2000, V12, N4 (OCT), P  
534-546  
ISSN: 1053-1807 Publication date: 20001000  
Publisher: JOHN WILEY & SONS INC, 605 THIRD AVE, NEW YORK, NY 10158-0012  
USA  
Language: English Document Type: REVIEW  
Geographic Location: Germany  
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING  
Abstract: Several attributes make magnetic resonance imaging (MRI)  
attractive for guidance of intravascular therapeutic procedures,  
including high soft tissue contrast, imaging in arbitrary oblique  
planes, lack of ionizing radiation, and the ability to provide  
functional information, such as flow velocity or flow volume per unit  
time, in conjunction with morphologic information. For MR guidance of  
vascular interventions to be safe, the interventionalist must be able  
to visualize catheters and guidewires relative to the vascular system  
and surrounding tissues. A number of approaches for rendering  
instruments visible in an MR environment have been developed, including  
both passive and active techniques. Passive techniques depend on  
contrast agents or susceptibility artifacts that enhance the appearance  
of the catheter in the image itself, whereas active techniques rely  
on supplemental hardware built into the catheter, such as a  
radiofrequency (RF) coil. Additionally, the ability to introduce an RF  
coil mounted on a catheter presents the opportunity to obtain  
high-resolution images of the vessel wall. These images can provide the  
capability to distinguish and identify various plaque components. The  
additional capabilities of MRI could potentially open up new  
applications within the purview of vascular interventions beyond those  
currently performed under X-ray fluoroscopic guidance. J. Magn. Reson.  
Imaging 2000;12:534-546. (C) 2000 Wiley-Liss, Inc.  
Descriptors--Author Keywords: interventions ; guidance ; MR angiography ;  
intravascular imaging ; catheters ; guidewires  
Identifiers--KeyWord Plus(R): ENHANCEMENT OMEN TECHNIQUE;

1/9/4 (Item 4 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
(c) 2004 Inst for Sci Info. All rts. reserv.

10027724 Genuine Article#: 477QC Number of References: 89  
Title: Interventional MRA and intravascular imaging  
Author(s): Ladd ME (REPRINT) ; Quick HH; Debatin JF  
Corporate Source: Univ Hosp Essen,Dept Radiol,OZ IIHufelandstr 55/D-45122  
Essen//Germany/ (REPRINT); Univ Hosp Essen,Dept Radiol,D-45122  
Essen//Germany/  
Journal: JOURNAL OF MAGNETIC RESONANCE IMAGING, 2000, V12, N2 (AUG), P  
534-546  
ISSN: 1053-1807 Publication date: 20000800  
Publisher: JOHN WILEY & SONS INC, 605 THIRD AVE, NEW YORK, NY 10158-0012  
USA  
Language: English Document Type: REVIEW  
Geographic Location: Germany  
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING  
Abstract: Several attributes make magnetic resonance imaging (MRI)  
attractive, for guidance of intravascular therapeutic procedures,  
including high soft tissue contrast, imaging in arbitrary oblique  
planes, lack of ionizing radiation, and the ability to provide  
functional information, such as, flow velocity or flow volume per unit  
time, in conjunction with morphologic information. For MR guidance of  
vascular interventions to be safe, the interventionalist must be able  
to visualize catheters, and guidewires, relative, to the vascular  
system and surrounding tissues. A number of approaches for rendering  
instruments visible in an MR environment have been developed, including  
both passive and active techniques. Passive, techniques depend on  
contrast agents or susceptibility artifacts that enhance the appearance  
of the catheter in the image itself, whereas active techniques rely on  
supplemental hardware built into the catheter, such as a radiofrequency  
(RF) coil. Additionally, the ability to introduce an RF coil mounted on  
a catheter presents the opportunity to obtain high-resolution images of  
the vessel wall. These images can provide the capability various plaque  
components. to distinguish and identify The additional capabilities of  
MRI could potentially open up new applications within the purview of  
vascular interventions beyond those currently performed under X-ray  
fluoroscopic guidance. (C) 2000 Wiley-Liss, Inc.  
Descriptors--Author Keywords: interventions ; guidance ; MR angiography ;  
intravascular imaging ; catheters ; guidewires  
Identifiers--KeyWord Plus(R): ENHANCEMENT OMEN TECHNIQUE;  
MAGNETIC-RESONANCE; OVERHAUSER-MARKER; IN-VIVO; VASCULAR INTERVENTIONS;  
FIELD INHOMOGENEITIES; CATHETER-TRACKING; GENE-EXPRESSION; ECHO

1/9/5 (Item 5 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
• (c) 2004 Inst for Sci Info. All rts. reserv.

08853257 Genuine Article#: 336VW Number of References: 71  
Title: Interventional and intravascular MR angiography  
Author(s): Ladd ME (REPRINT) ; Debatin JF  
Corporate Source: UNIV ESSEN GESAMTHSCH KLINIKUM, ZENT INST RONTGENDIAGNOST,  
OZ 2, HUFELANDSTR 55/D-45122 ESSEN//GERMANY/ (REPRINT)  
Journal: HERZ, 2000, V25, N4 (JUN), P440-451  
ISSN: 0340-9937 Publication date: 20000600  
Publisher: URBAN & VOGEL, C/O SPRINGER GMBH & CO AUSLIEFERUNGSGESELLSCHAFT  
KUNDENSERVICE ZEITSCHRIFTEN, D-69126 HABERSTRASSE 7, GERMANY  
Language: English Document Type: ARTICLE  
Geographic Location: GERMANY  
Subfile: CC CLIN--Current Contents, Clinical Medicine  
Journal Subject Category: CARDIAC & CARDIOVASCULAR SYSTEMS  
Abstract: Magnetic resonance imaging (MRI) has a number of characteristics  
which make it attractive for guidance of intravascular therapeutic  
procedures, including high soft tissue contrast, imaging in any  
arbitrary oblique plane, lack of ionizing radiation, and the ability to  
provide functional information, such as flow velocity and volume per  
unit time. For MR guidance of vascular interventions to be safe,  
catheters and guidewires must be visualized relative to the vascular  
system and surrounding tissues  
A number of approaches for making instruments visible in an MR  
environment are presented, including both passive and active techniques  
Passive techniques depend on contrast agents or susceptibility  
artifacts, whereas active techniques, including MR tracking? MR  
profiling, and active field inhomogeneity, use some form of electrical  
coil built into the instrument. The potential for obtaining  
high-resolution images of the vessel wall using coils built into a  
catheter is also discussed.  
These images provide the capability to distinguish and identify  
various plaque components. The additional capabilities of MRI could  
potentially open up new applications beyond those currently performed  
under X-ray fluoroscopic guidance.  
Descriptors--Author Keywords: interventions ; MR angiography ;  
catheters/guidewires

1/9/6 (Item 6 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
• (c) 2004 Inst for Sci Info. All rts. reserv.

07634931 Genuine Article#: 190CM Number of References: 38

- Title: Instrument visualization in a magnetic resonance imaging environment  
Author(s): Ladd ME; Debatin JF (REPRINT)

Corporate Source: UNIV ZURICH HOSP,MR CTR, DEPT RADIOL, RAMISTR 100/CH-8091  
ZURICH//SWITZERLAND/ (REPRINT); UNIV ZURICH HOSP,MR CTR, DEPT  
RADIOL/CH-8091 ZURICH//SWITZERLAND/

Journal: SEMINARS IN INTERVENTIONAL RADIOLOGY, 1999, V16, N1, P13-21

ISSN: 0739-9529 Publication date: 19990000

Publisher: THIEME MEDICAL PUBL INC, 333 SEVENTH AVE, NEW YORK, NY 10001

Language: English Document Type: REVIEW

Geographic Location: SWITZERLAND

Subfile: CC CLIN--Current Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

Abstract: Magnetic resonance (MR) imaging has a number of characteristics that make it attractive for interventional guidance, including superior soft tissue contrast; the lack of ionizing radiation; the ability to provide functional information such as flow, perfusion, and diffusion; and the ability to monitor tissue temperature during ablation therapy. To date, MR scanning has played only a minor role in interventional guidance. One hindrance is that current interventional instruments are poorly visualized in an MR image. This article presents a number of approaches to making instruments visible in an MR scanning environment. Passive techniques, using signal voids, contrast agents, or susceptibility artifacts, as well as active alternatives, including optical triangulation, MR tracking, MR profiling, and active field inhomogeneity, are discussed.

Descriptors--Author Keywords: instrument visualization ; interventional MR ; susceptibility ; MR tracking ; MR profiling ; optical triangulation ; field inhomogeneity

1/9/7 (Item 7 from file: 34)

• DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
(c) 2004 Inst for Sci Info. All rts. reserv.

07328831 Genuine Article#: 151BH Number of References: 25

Title: Investigation of intraoperative brain deformation using a 1.5-T interventional MR system: Preliminary results

Author(s): Maurer CR; Hill DLG (REPRINT) ; Martin AJ; Liu HY; McCue M; Rueckert D; Lloret D; Hall WA; Maxwell RE; Hawkes DJ; Truwit CL

Corporate Source: GUYS HOSP, DEPT RADIOLOG SCI, 5TH FLOOR THOMAS GUY HOUSE/LONDON SE1 9RT//ENGLAND/ (REPRINT); GUYS HOSP, DEPT RADIOLOG SCI/LONDON SE1 9RT//ENGLAND/; UNIV LONDON KINGS COLL, GUYS KINGS & ST THOMAS SCH MED, DIV RADIOLOG SCI & MED ENGN/LONDON SE1 9RT//ENGLAND/; UNIV MINNESOTA, DEPT RADIOLOG/MINNEAPOLIS//MN/55455; PHILIPS MED SYST,/BEST//NETHERLANDS/; UNIV MINNESOTA, DEPT NEUROSURG/MINNEAPOLIS//MN/55455

Journal: IEEE TRANSACTIONS ON MEDICAL IMAGING, 1998, V17, N5 (OCT), P 817-825

ISSN: 0278-0062 Publication date: 19981000

Publisher: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 345 E 47TH ST, NEW YORK, NY 10017-2394

Language: English Document Type: ARTICLE

Geographic Location: ENGLAND; USA; NETHERLANDS

Subfile: CC CLIN--Current Contents, Clinical Medicine; CC ENGI--Current Contents, Engineering, Computing & Technology

Journal Subject Category: ENGINEERING, BIOMEDICAL; RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING; ENGINEERING, ELECTRICAL & ELECTRONIC

Abstract: All image-guided neurosurgical systems that we are aware of assume that the head and its contents behave as a rigid body. It is important to measure intraoperative brain deformation (brain shift) to provide some indication of the application accuracy of image-guided surgical systems, and also to provide data to develop and validate nonrigid registration algorithms to correct for such deformation. We are collecting data from patients undergoing neurosurgery in a high-field (1.5 T) interventional magnetic resonance (MR) scanner. High-contrast and high-resolution gradient-echo MR image volumes are collected immediately prior to surgery, during surgery, and at the end of surgery, with the patient intubated and lying on the operating table in the operative position. In this paper we report initial results from six patients: one freehand biopsy, one stereotactic functional procedure, and four resections. We investigate intraoperative brain deformation by examining threshold boundary overlays and difference images and by measuring ventricular volume. We also present preliminary results obtained using a nonrigid registration algorithm to quantify deformation. We found that some cases had much greater deformation than others, and also that, regardless of the procedure, there was very little deformation of the midline, the tentorium, the hemisphere contralateral to the procedure, and ipsilateral structures except those that are within 1 cm of the lesion or are gravitationally above the Surgical site.

Descriptors--Author Keywords: brain deformation ; brain shift ; image-guided surgery ; intraoperative imaging ; MRI ; neurosurgery

Identifiers--KeyWord Plus(R): MAGNETIC-RESONANCE; REGISTRATION

1/9/8 (Item 8 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
• (c) 2004 Inst for Sci Info. All rts. reserv.

06667773 Genuine Article#: ZJ140 Number of References: 34

• Title: Interventional MR tomography: equipment concepts.

Author(s): Adam G (REPRINT) ; Bucker A; Glowinski A; NolteErnsting C;  
Neuerburg J; Gunther RW

Corporate Source: UNIV KLINIKUM, RWTH AACHEN, RADIOL DIAGNOST KLIN,  
PAUWELSTR 30/D-52074 AACHEN//GERMANY/ (REPRINT)

Journal: RADIOLOGE, 1998, V38, N3 (MAR), P168-172

ISSN: 0033-832X Publication date: 19980300

Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010

Language: German Document Type: ARTICLE

Geographic Location: GERMANY

Subfile: CC CLIN--Current Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

Abstract: Interventional MRI is one of the most recent developments of clinical MR imaging. Because of the development of open MR systems and very compact high-field systems, a number of interventional procedures are already possible today under MR control and will be tested in experimental and clinical investigations. The currently commercially available systems differ with respect to their static magnetic field strength, their gradient systems and patient access. In addition, there are differences concerning their space requirements and costs. All systems have components facilitating interventional procedures. In this article we discuss the advantages and shortcomings of these commercially available systems and look at future developments in interventional MR equipment.

Descriptors--Author Keywords: MR imaging ; MR, interventions ; MR systems

Identifiers--KeyWord Plus(R): THERMOTHERAPY; LESIONS; BIOPSY; TUMORS; LIVER



1/9/9 (Item 9 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
▲ (c) 2004 Inst for Sci Info. All rts. reserv.

05800988 Genuine Article#: WY169 Number of References: 7

Title: Catheter visualisation in MR tomography: First animal experimental experiences with field inhomogeneity catheters.

Author(s): Adam G (REPRINT) ; Glowinski A; Neuerburg J; Bucker A; vanVaals JJ; Hurtak W; Gunther RW

Corporate Source: RHEIN WESTFAL TH AACHEN, RADIOL DIAGNOST KLIN, PAUWELSSTR 30/D-52074 AACHEN//GERMANY/ (REPRINT); CORDIS BV, /RODEN//NETHERLANDS/; PHILIPS MED SYST, /BEST//NETHERLANDS/

Journal: ROFO-FORTSCHRITTE AUF DEM GEBIET DER RONTGENSTRAHLEN UND DER BILDGEBENDEN VERFAHREN, 1997, V166, N4 (APR), P324-328

ISSN: 0936-6652 Publication date: 19970400

Publisher: GEORG THIEME VERLAG, P O BOX 30 11 20, D-70451 STUTTGART, GERMANY

Language: German Document Type: ARTICLE

Geographic Location: GERMANY; NETHERLANDS

Subfile: CC CLIN--Current Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

Abstract: Purpose: To assess the feasibility of a new developed field inhomogeneity catheter for interventional MR imaging in vivo. Materials and methods: Three different prototypes of a field inhomogeneity catheter were investigated in 6 pigs. The catheters were introduced in Seldinger technique via the femoral vessels over a guide wire on an interventional MR system (Philips Gyroscan NT combined with a C-arm fluoroscopy unit [Philips BV 212]). Catheters were placed in veins and arteries. The catheter position was controlled by a fast gradient echo sequence (Turbo Field Echo[TFE]). Results: Catheters were introduced over a guide wire without complications in all cases. Using the field inhomogeneity concept, catheters were easily visualised in the inferior vena cava and the aorta by the fast gradient echo technique on MR in all cases. Although aortic branches were successfully cannulated, the catheters were not displayed by the TFE technique due to the complex and tortuous anatomy. All animals survived the experiments without complications. Conclusion: MR guided visualisation of a field inhomogeneity catheter is a simple concept: which can be realised on each MR scanner and may allow intravascular MR guided interventions in future.

Descriptors--Author Keywords: MRI ; interventional MR ; catheter visualisation

Identifiers--KeyWord Plus(R): SYSTEM

Cited References:

FRAHM C, 1996, V164, P62, ERGEBNISSE FORTSCHR  
GEHL HB, 1996, V165, P70, ROFO FORTSCHR RONTG  
GLOWINSKI A, 1996, V164, P114, ROFO FORTSCHR RONTG  
LEUNG DA, 1995, V164, P1265, AM J ROENTGENOL  
SCHENCK JF, 1995, V195, P805, RADIOLOGY  
VANVAALS JJ, 1995, V197, P220, RADIOLOGY  
VOGL TJ, 1995, V35, P188, RADIOLOGE

20/9/1  
DIALOG(R) File 155:MEDLINE(R)  
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14452603 PMID: 10450155

Nanoliter-volume <sup>1</sup>H NMR detection using periodic stopped-flow capillary electrophoresis.

Olson D L; Lacey M E; Webb A G; Sweedler J V  
Department of Chemistry, Electrical and Computer Engineering, University of Illinois at Urbana-Champaign 61801, USA.

Analytical chemistry (UNITED STATES) Aug 1 1999, 71 (15) p3070-6,  
ISSN 0003-2700 Journal Code: 0370536

Contract/Grant No.: GM53030; GM; NIGMS

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

Recent advances in the analysis of nanoliter volumes using <sup>1</sup>H NMR **microcoils** have led to the application of **microcoils** as detectors for capillary electrophoresis (CE). Custom NMR probes consisting of 1-mm-long solenoidal **microcoils** are fabricated from 50-micron diameter wire wrapped around capillaries to create nanoliter-volume detection cells. For geometries in which the capillary and static magnetic field are not parallel, the electrophoretic current induces a magnetic field gradient which degrades the spectroscopic information obtainable from CE/NMR. To reduce this effect and allow longer analyte observation times, the electrophoretic voltage is periodically interrupted so that 1-min high-resolution NMR spectra are obtained for every 15 s of applied voltage. The limits of detection (LODs; based on S/N = 3) for CE/NMR for arginine are 57 ng (330 pmol; 31 mM) and for triethylamine (TEA) are 9 ng (88 pmol; 11 mM). Field-amplified stacking is used for sample preconcentration. As one example, a 290-nL injection of a mixture of arginine and TEA both at 50 mM (15 nmol of each injected) is stacked severalfold for improved concentration LODs while achieving a separation efficiency greater than 50,000. Dissolving a sample in a mixture of 10% H<sub>2</sub>O/90% D<sub>2</sub>O allows H<sub>2</sub>O to serve as the nearly ideal neutral tracer and allows direct observation of the parabolic and flat flow profiles associated with gravimetric and electrokinetic injection, respectively. The unique capabilities of CE and the rich spectral information provided by NMR spectroscopy combine to yield a valuable analytical tool, especially in the study of mass-limited samples.

Tags: Support, Non-U.S. Gov't; Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.

Descriptors: Electrophoresis, Capillary--methods--MT; \* **Magnetic Resonance Spectroscopy**--methods--MT; Arginine--analysis--AN; Deuterium; Electrophoresis, Capillary--instrumentation--IS; Ethylamines--analysis--AN; Glycine--analysis--AN; Magnetics; Osmosis; Sensitivity and Specificity; **Temperature**

2/9/3  
DIALOG(R)File 73:EMBASE  
(c) 2004 Elsevier Science B.V. All rts. reserv.

05039384 EMBASE No: 1992179600

Three-dimensional NMR microscopy: Improving SNR with **temperature**  
and **microcoils**

McFarland E.W.; Mortara A.

Chem. and Nuclear Engineering Dept., University of California, Santa  
Barbara, CA 93106 United States

Magnetic Resonance Imaging ( MAGN. RESON. IMAGING ) (United States) 1992  
, 10/2 (279-288)

CODEN: MRIMD ISSN: 0730-725X

DOCUMENT TYPE: Journal; Article

LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH

It is widely held that the spatial resolution achievable by NMR microscopic imaging is limited in biological systems by diffusion to approximately 1-5  $\mu\text{m}$ . However, these estimates were developed for specific imaging techniques and represent practical rather than fundamental limits. NMR imaging is limited by the signal-to-noise ratio (SNR). Diffusion effects on spatial resolution can be made arbitrarily small in principle by increasing the gradient strength. The exponential signal attenuation from random spin motion in a gradient, however, will reduce the signal far below the noise level when the voxel size is reduced much below 5  $\mu\text{m}$ . Two factors can be optimized to improve the SNR: (1) the inductive linkage between microscopic samples and the detection apparatus and (2) the **temperature** of the rf probe. In this work, the filling factor was optimized using inductors with diameters less than 1 mm. It is furthermore shown that probe circuit cooling results in significant improvements in SNR, whereas cooling of the preamplifier is of little value when proper noise matching between the resonant circuit and preamplifier is accomplished. Using three-dimensional Fourier imaging techniques, we have obtained images of single-cell organisms with spatial resolution of approximately 6  $\mu\text{m}$ . Practical limitations include mechanical stability of the apparatus, thermal shielding between the sample and probe, and the magnetic susceptibility of the sample.

MEDICAL DESCRIPTORS:

\*microscopy; \*nuclear magnetic resonance; \*signal noise ratio  
alga; amplifier; article; cooling; fourier analysis; mathematical analysis;  
nonhuman; optical resolution

SECTION HEADINGS:

014 Radiology

20/9/3  
DIALOG(R) File 155:MEDLINE(R)  
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13418730 PMID: 9090410

MR artifacts, **heat** production, and ferromagnetism of Guglielmi detachable coils.

Hartman J; Nguyen T; Larsen D; Teitelbaum G P  
Department of Surgery, University of California at San Francisco Medical Center, USA.

AJNR. American journal of neuroradiology (UNITED STATES) Mar 1997, 18

(3) p497-501, ISSN 0195-6108 Journal Code: 8003708

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

The Guglielmi detachable coil, a platinum **microcoil** used in the endovascular treatment of intracranial aneurysms, was studied in vitro for its MR imaging artifacts, **heat** production, and ferromagnetism. In addition, imaging artifacts were studied in vivo in eight patients who had undergone therapeutic placement of these coils. These devices displayed a very low level of MR artifact and no ferromagnetism or **heat** production. We conclude that the Guglielmi detachable coil is compatible with MR imaging in terms of both safety and image quality.

Tags: Comparative Study; Human

Descriptors: Aneurysm, Ruptured--therapy--TH; \*Embolization, Therapeutic--instrumentation--IS; \*Intracranial Aneurysm--therapy--TH; \***Magnetic Resonance Imaging**--instrumentation--IS; \*Postoperative Complications--diagnosis--DI; \*Subarachnoid Hemorrhage--therapy--TH; Aneurysm, Ruptured--diagnosis--DI; Artifacts; Brain--pathology--PA; Equipment Design; **Heat**; Intracranial Aneurysm--diagnosis--DI; Magnetism; Phantoms, Imaging; Subarachnoid Hemorrhage--diagnosis--DI

31/9/4  
DIALOG(R) File 155:MEDLINE(R)  
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10294072 PMID: 7991099

Embolisation of orbital varix.

Takechi A; Uozumi T; Kiya K; Yano T; Sumida M; Yoshikawa S; Pant B  
Department of Neurosurgery, Hiroshima University School of Medicine,  
Japan.

Neuroradiology (GERMANY) Aug 1994, 36 (6) p487-9, ISSN 0028-3940  
Journal Code: 1302751

Document type: Case Reports; Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

A 34-year-old man with intermittent exophthalmos, found to have a large varix in the right orbit, was treated by endovascular surgery. Percutaneous transfemoral venous catheterisation and embolisation of the orbital varix was performed on two occasions. A Tracker 18 **microcatheter** was introduced through the right inferior petrosal sinus, cavernous sinus, superior ophthalmic vein and then into the varix, following a guidewire. Superselective venography of the right ophthalmic vein showed the varix. A total of 204 platinum **microcoils** was used to pack the varix. At the time of discharge, the exophthalmos had largely resolved. As this technique is much less **invasive** than surgical resection, we recommend an attempt at endovascular embolisation of orbital varices prior to surgical removal.

Tags: Human; Male

Descriptors: \*Embolization, Therapeutic--instrumentation--IS; \*Orbit  
--blood supply--BS; \*Varicose Veins--therapy--TH; Adult; Catheterization,  
Peripheral--instrumentation--IS; **Magnetic Resonance Imaging**;  
Prostheses and Implants; **Tomography**, X-Ray Computed; Varicose Veins  
--diagnosis--DI

Record Date Created: 19950109